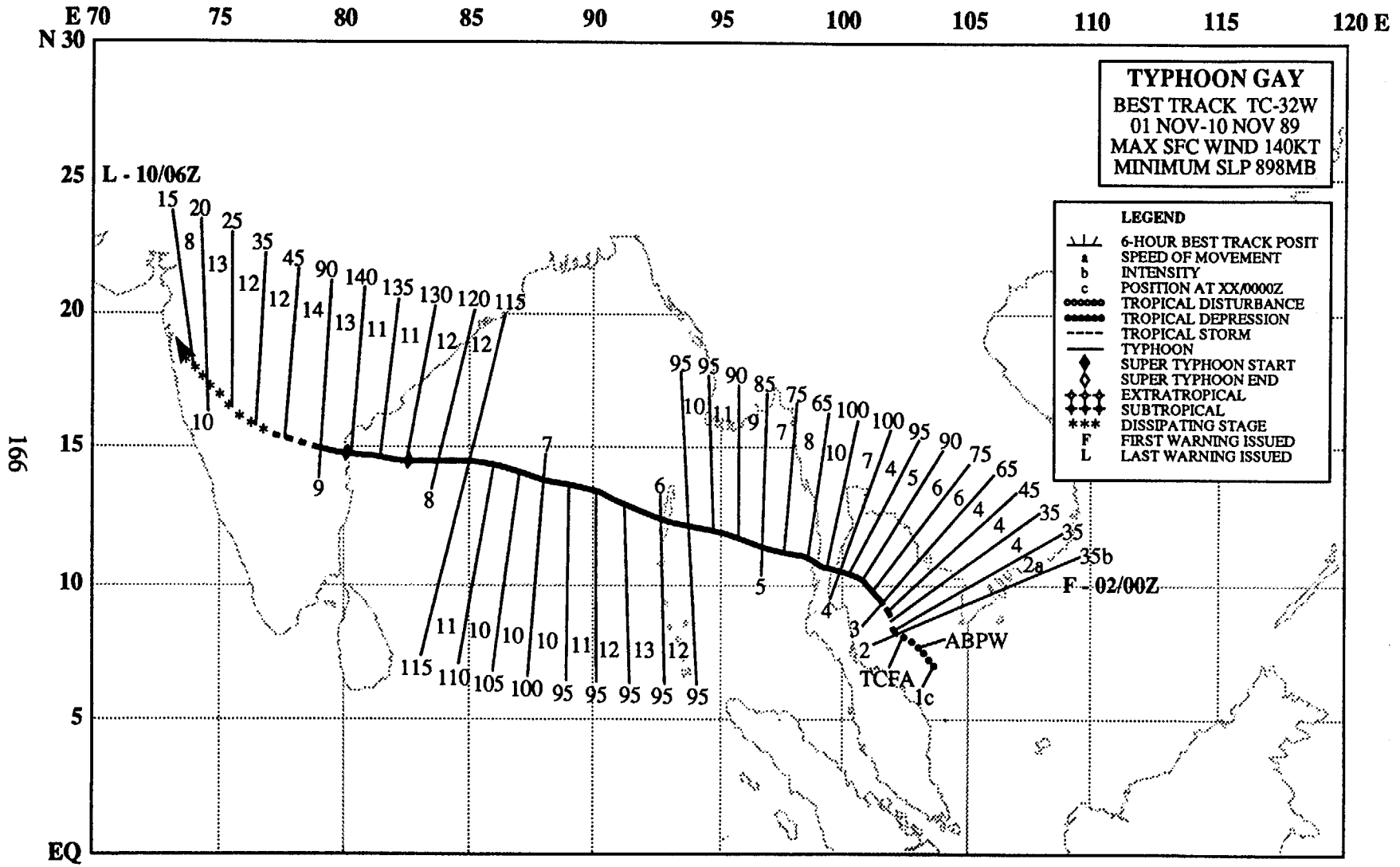
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TYPHOON GAY
BEST TRACK TC-32W
01 NOV-10 NOV 89
MAX SFC WIND 140KT
MINIMUM SLP 898MB
LEGEND
6-HOUR BEST TRACK POSIT
SPEED OF MOVEMENT
INTENSITY
POSITION AT XX/0000Z
TROPICAL DISTURBANCE
TROPICAL DEPRESSION
TROPICAL STORM
TYPHOON
SUPER TYPHOON START
SUPER TYPHOON END
EXTRATROPICAL
SUBTROPICAL
DISSIPATING STAGE
FIRST WARNING ISSUED
LAST WARNING ISSUED
L - 10/06Z
F - 02/00Z
ABPW
TCFA
1c
2a
35b

TYPHOON GAY (32W)

The first tropical cyclone of November turned out to be the worst tropical cyclone to affect the Malay Peninsula in 35 years. Gay developed in the Gulf of Thailand, crossed the Malay Peninsula into the Bay of Bengal and slammed into India with peak sustained winds of 140 kt (70 m/sec). Unique because of its small size, intensity, and point of origin, Gay challenged forecasters by crossing two different tropical cyclone basins and almost entering a third.

From a climatological point of view, an occasional tropical cyclone may move into the Gulf of Thailand from the South China Sea, but it is rare for genesis and intensification to occur in the Gulf — a relatively small body of water surrounded by land on three sides. However, on the first of November, satellite imagery detected the presence of a concentrated area of convection with a well-organized upper-level anticyclone. At the same time, sparse ship reports in the Gulf showed that sea-level pressures were relatively high — near 1008 mb. The continued increase in the amount and organization of convection prompted JTWC to mention it on the 010600Z Significant Tropical Weather Advisory, noting that a low-level circulation was evident in the monsoon trough. Maximum sustained surface winds were estimated to be 10 to 15 kt (5 to 8 m/sec). During the next 15 hours, the disturbance continued to consolidate and estimated winds increased to 25 kt (13 m/sec). At 012100Z, JTWC issued a Tropical Cyclone Formation Alert.

Aided by its small size, dual outflow channels to the north and south, and the warm Gulf waters, the tropical cyclone spun up rapidly, and at 020000Z JTWC issued a 36-hour Tropical Depression Warning on Tropical Depression 32W. It became apparent that the cyclone would continue intensification, and six hours later, JTWC issued the first 72-hour Tropical Cyclone Warning on the system, upgrading it to tropical storm intensity. As Gay intensified, it presented a paradox to forecasters. While the satellite intensity estimates correctly diagnosed intensification, the synoptic data in Malaysia and Thailand indicated weakening winds and higher pressures. The synoptic data were correctly interpreted as indicators of increased subsidence produced by the intensifying midget system. Subsequent JTWC warnings thus reflected that Gay would reach typhoon intensity.

At 021800Z, Gay began to intensify more rapidly than anticipated reaching typhoon intensity at 030000Z. The eye apparently passed directly over the **Seacrest**, a commercial oil drilling ship moored in the Gulf. Confused seas with estimated heights of 35 to 45 feet (11 to 14 m) caused the ship to capsize shortly after eye passage. Gay's intensification continued, reaching 100 kt (51 m/s) at 040600Z just before it crashed into Champhun, Thailand which is located 210 nm (390 km) south-southwest of Bangkok. The radar at Champhun (WMO 48517) had tracked Gay for 18 hours, before its reports abruptly ceased shortly before the

typhoon (Figure 3-32-1) came inshore. At least four hundred and fifty-eight people were died and over 600 fishermen were reported missing at sea. In addition, two hundred fishing vessels were lost or missing.

As Gay moved slowly to the northwest in the Gulf, JTWC forecasters anticipated that a ridge would build to the north, and correctly forecast the cyclone to make a left turn and move across the Malay Peninsula. Gay weakened briefly as it crossed the Peninsula, entering the Bay of Bengal with maximum winds of 65 kt (33 m/s) at 041200Z. Situated south of the mid-level ridge, Gay continued to track west-northwestward across the Bay of Bengal at an average speed of 10 kt (19 km/hr). Gay intensified slowly in an area of weak vertical wind shear and warm sea surface temperatures, reaching an intensity of 95 kt (49 m/sec) by 051200Z. Restrictions to the upper-level outflow inhibited further development for the next 36 hours.

At 070000Z, Gay attained an intensity of 100 kt (51 m/sec), and took a more westward course as the mid-level ridge strengthened to the north. Without any significant restrictions to its outflow, the cyclone intensified for the next 42 hours until it reached the coast of India. Gay (Figure 3-32-2) reached super typhoon intensity at 080600Z, with winds of 130 kt (67 m/sec). Gay (Figure 3-32-3) made landfall in a sparsely populated area of India approximately 120 nm

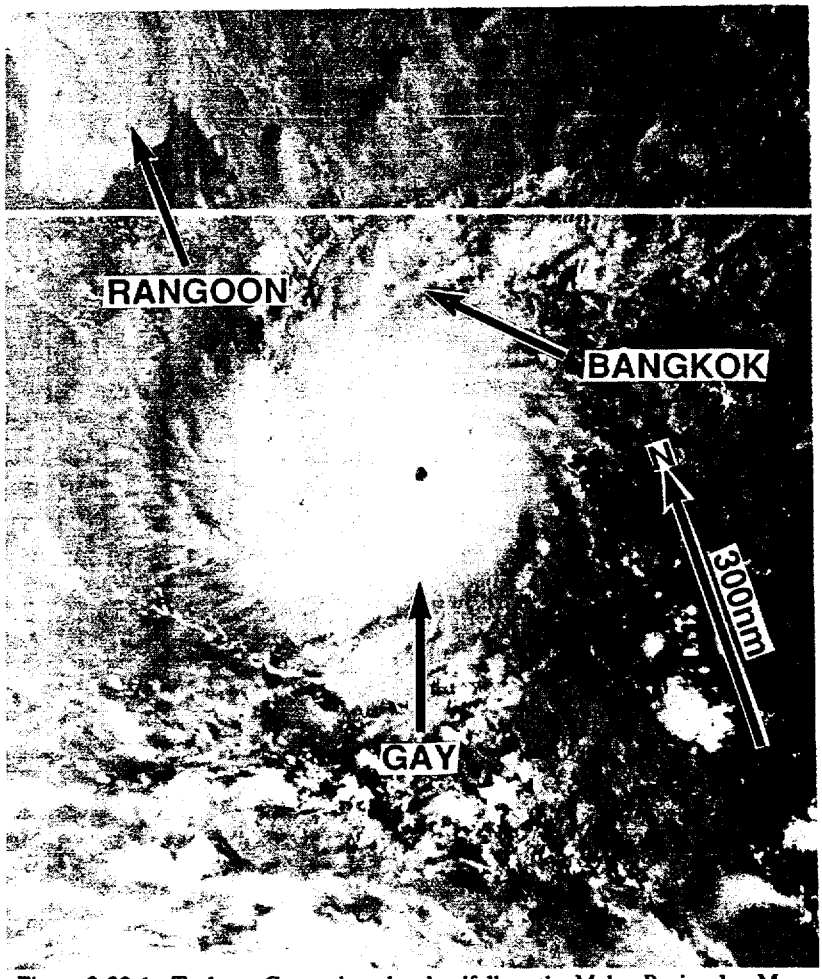

Figure 3-32-1. Typhoon Gay as it makes landfall on the Malay Peninsula. More than 1000 people were reported dead or missing in Gay's aftermath (040042Z November NOAA visual imagery).

(220 km) north of Madras at 081800Z, with maximum sustained winds estimated at 140 kt (72 m/sec). While there was concern that the Dvorak intensity estimation technique might have overestimated Gay's intensity, photos of destruction showed that Gay was a very intense, but very small, cyclone. In-country analyses of Indian synoptic data indicated that the 30-kt (15-m/sec) wind radii did not extend much beyond 50 nm (95 km) — (personal communication with Dr. G. S. Mandal, Indian Meteorological Service).

Twelve hours after making landfall, Gay had weakened to 45 kt (23 m/s). Because of the possibility of its reemergence into the Arabian Sea, JTWC continued to issue warnings on the system as it moved across India at 13 kt (24 km/hr). After 090600Z, Gay took a more northwestward overland track. At 100600Z, JTWC issued its final warning as the system dissipated in the Western Ghats approximately 75 nm (140 km) southeast of Bombay. Gay weakened much faster than anticipated as it moved across India. This was a result of its small size and small over-water fetch. Once inland the small fetch, which supplied Gay's latent heat source, was rapidly cut off. Because Gay was so small and went inshore in a rural area, it caused only 39 deaths. However, over 20,000 homes were destroyed or damaged.

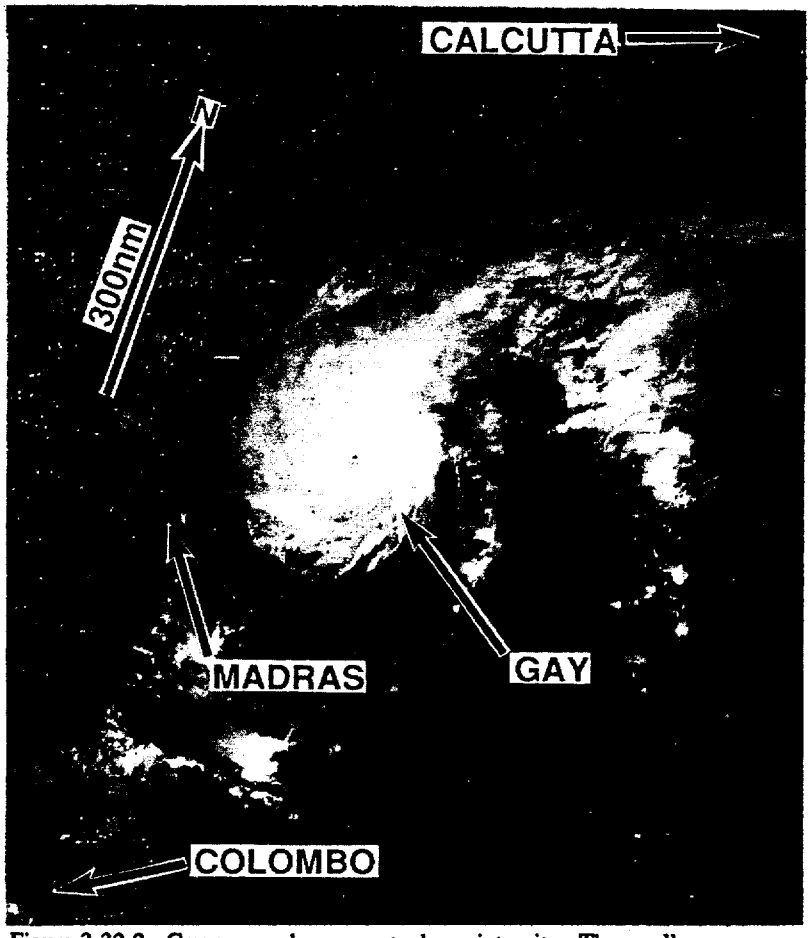

Figure 3-32-2. Gay approaches super typhoon intensity. The small eye appears in a small, compact central dense overcast (080340Z November DMSP visual imagery).

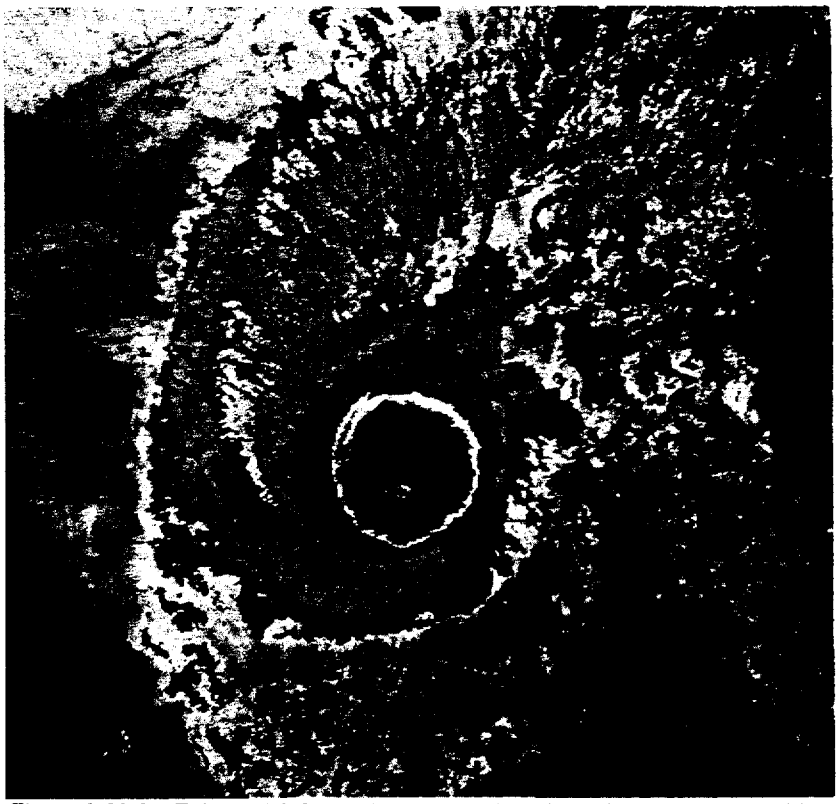

Figure 3-32-3. Enhanced infrared (above) and low-light visual (below) satellite picture pair of Gay at the coast of India. The city lights, the moonlit coast line and Gay's cloudiness show on the visual image. The enhanced infrared reveals the small eye and cold surrounding overcast (081612Z November DMSP visual and infrared imagery).